

# Coronis New Generation

## Service Manual

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## 2. Service precautions

### General

**Caution:** Remove the power plug from the mains outlet before removing any cover

- Moving or disassembling the I-Guard control board will require the calibration of the I-Guard and the panel.
- Opening the display must be done in a dust-poor environment, to avoid dust particles on the glass plate or the panel.
- Opening the display must be done in a dust-poor environment, to avoid dust particles on the panel.

### Precautions for assembling the display

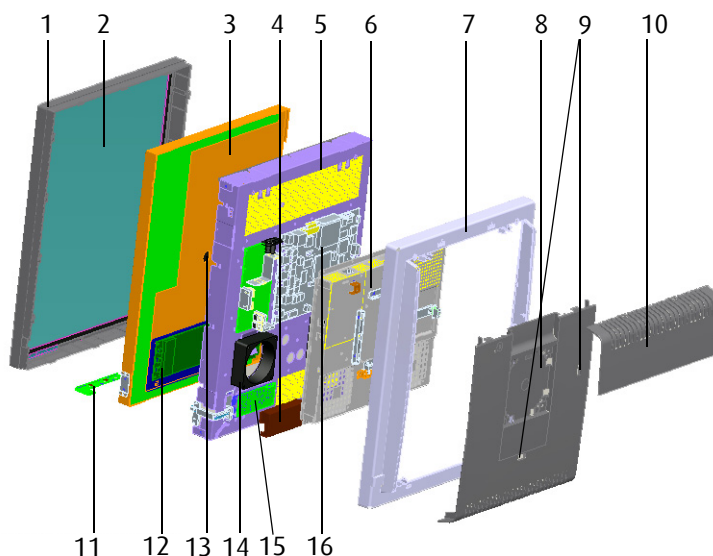
- When assembling the display, place all the screws in their holes without tightening them before they are all in place and the metallic cover is resting without any mechanical stress on the panel.
- Color spots on the display might be observed during operation if any mechanical stress would be applied to the panel.

### Handling Precautions for the LCD panel

1. Since the panel surface is easily damaged, pay attention not to scratch it.
2. Wipe off water drops immediately. Long contact with water may cause discoloration or spots.
3. When the panel surface is soiled, wipe it with absorbent cotton or any other soft cloth.
4. Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
5. Since CMOS LSI is used in the LCD panel, take care of static electricity and ensure human earth when handling.
6. Do not open nor modify the LCD panel assembly.
7. When you insert or remove the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the LCD panel.
8. After installation of the LCD panel into the display frame, do not twist nor bend the LCD panel even momentarily. Otherwise the TFT Module may be damaged.
9. The Backlight lamp contains mercury. Do not throw it in the trash. Dispose of it as required by local ordinances or regulations.
10. Do not display the same pattern on the LCD panel for more than 10 hours, to avoid image retention.

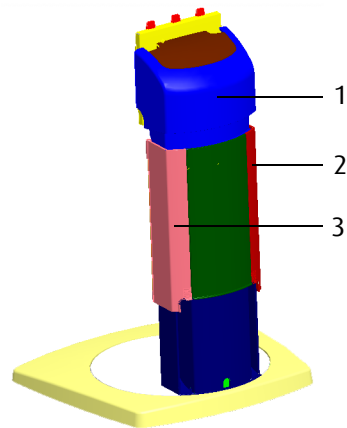
### 3. List of serviceable parts

#### Display panel

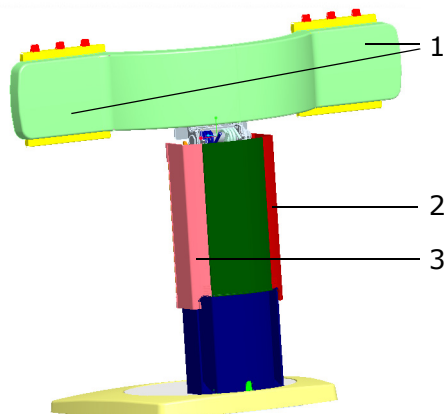


No	Part	MDCC 2121	MDCC 3120 DL	MDCG 2121 CB	MDCG 3120 CB
1	Bezel	V622581	V622518	V622518	V622518
2	Front filter	V6049651	V604917	V604897	V604917
3	LCD panel	V322195	K5800400	V322196	V322309
4	I-Guard cover	V604850	V604850	V604850	V604850
5	LCD cover	V604963	V604836	V604836	V604836
6	Signal board cover	V604910	V604910	V604910	V604910
7	Mid cover	V622582	V622519	V622519	V622519
8	Rear cover	V622520	V622520	V622520	V622520
8	Rear cover (End 2007)	V6225201	V6225201	V6225201	V6225201
9	Display release button	V622522	V622522	V622522	V622522
10	Connector cover	V622521	V622521	V622521	V622521
11	Control panel (Bef. Jan. 2007)	K5801341	K5801341	K5801341	K5801341
11	Control panel (Aft. Jan. 2007)	K5801344	K5801344	K5801344	K5801344
11	Control panel (End 2007)	K5801345	K5801345	K5801345	K5801345
12	Backlight inverters	-	K5801000	B557307	-
13	Backlight sensor (BLOF)	K5801351	K5801351	K5801351	K5801351

No	Part	MDCC 2121	MDCC 3120 DL	MDCG 2121 CB	MDCG 3120 CB
14	Fan	B3246001 D	B3246001 D	B3246001 D	B3246001 D
15	I-Guard unit	K5801338	K5801338	K5801339	K5801339
16	Signal board (bef. Jan. 2007)	K5801354	K5801354	K5801353	K5801353
16	Signal board (aft. Jan. 2007)	K5801358	K5801358	K5801357	K5801357

**Single-head foot**

No.	Description	Part no.
1	Cover neck	V622526
2	Cover left	V622530
3	Cover right	V622531

**Dual-head foot**

No.	Description	Part no.
1	Arm cover	V622569

No.	Description	Part no.
2	Cover left	V622530
3	Cover right	V622531

### Accessories

Part	MDCC 2121	MDCC 3120 DL	MDCG 2121 CB	MDCG 3120 CB
Power supply (external)	B5572244	B5572861	B5572244	B5572244
Power cable Euro	Z348791	Z348791	Z348791	Z348791
Power cable US	Z348790	Z348790	Z348790	Z348790
Power cable China	Z3487500	Z3487500	Z3487500	Z3487500
Power cable UK	B195613	B195613	B195613	B195613
DVI cable	B5580552	B5580552	B5580552	B5580552
USB cable	B558127	B558127	B558127	B558127

### Packing

Part	MDCC 2121	MDCC 3120 DL	MDCG 2121 CB	MDCG 3120 CB
Box display with-out foot	K6100009	K6100009	K6100009	K6100009
Buffer display front	K6100002	K6100002	K6100002	K6100002
Buffer display rear	K6100003	K6100003	K6100003	K6100003
Buffer display corner	K6100004	K6100004	K6100004	K6100004
Plastic bag display	C592904	C592904	C592904	C592904
Box single head with foot	K6100008	K6100008	K6100008	K6100008
Box dual head with foot	K6100007	K6100007	K6100007	K6100007
Box foot single	K6100010	K6100010	K6100010	K6100010
Box foot dual	K6100011	K6100011	K6100011	K6100011

## **4. Service instructions**



## 4.1 Firmware upgrade

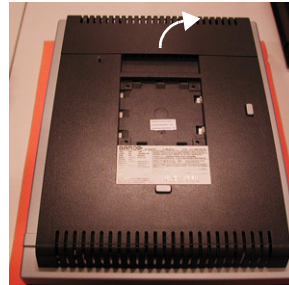
To upload the firmware with  
**Mfdcontrol:**

1. Start the program **Mfdcontrol.exe** (version 2.2.5.0 at least)
2. In the main menu, select the display of which you wish to upload the firmware.
3. In the main menu, click the **Upload** button.
4. In the "Zak system" area, check options **Code** and **Eeprom** and **Edid**.
5. Also in the "Zak system" area, DO NOT check options **Forced EE upload** and **Forced Product Selection**.
6. Click the **Select Code (.xml files)** button.
7. Locate and select the proper .xml file and click **Open**.
8. During the upload, a dialog box is displayed with the status. The display will reboot when the upload is finished.  
When finished, a message is displayed. Press **OK** and **Exit** to return to the main menu.

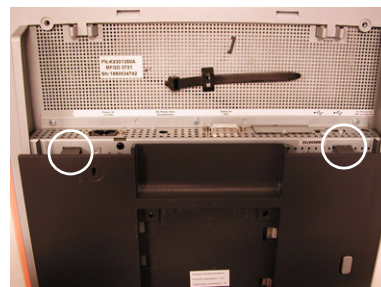
## 4.2 Plastic parts

To remove the plastics:

1. Put the display face down on a soft surface.
2. Remove the connector compartment cover.

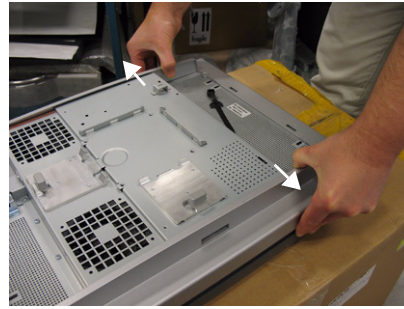


3. Remove the plastic rear cover (dark gray). Therefore press the 4 clips fixing the cover.

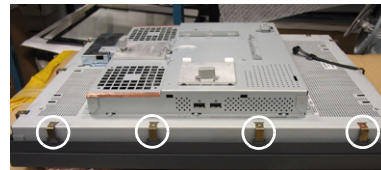


4. Remove the plastic mid cover (metallic gray). Therefore unscrew the 4 screws fixing the cover. Pull the cover sides outward while lifting up the cover.





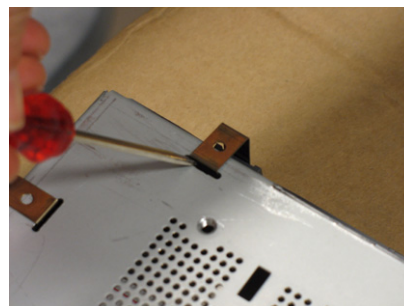
5. Turn the display upside down.
6. Remove the clips fixing the bezel. There are 4 clips at each long side and 3 clips at each short side.



Location of clips at long side



Location of clips at short side

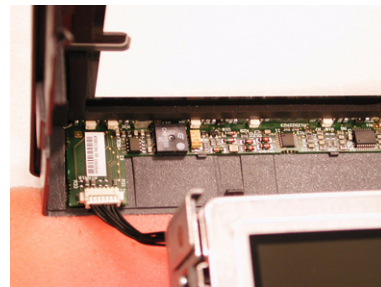


7. Carefully lift the bezel. The bezel is still fixed to the rest of the display by the control panel cable.





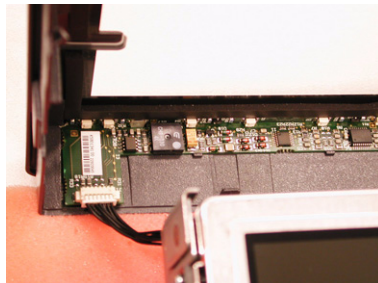
8. When the bezel is released completely, disconnect the connector from the control board.



### 4.3 Control panel

**To remove the control panel board:**

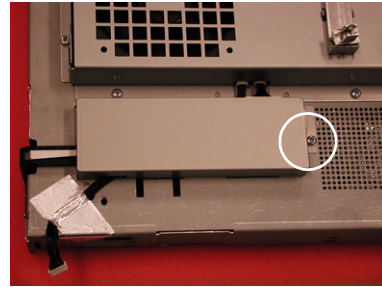
1. Remove the plastic parts and disconnect the control panel connector.
2. The control panel board is clipped inside the bezel. Gently release it from its clips.



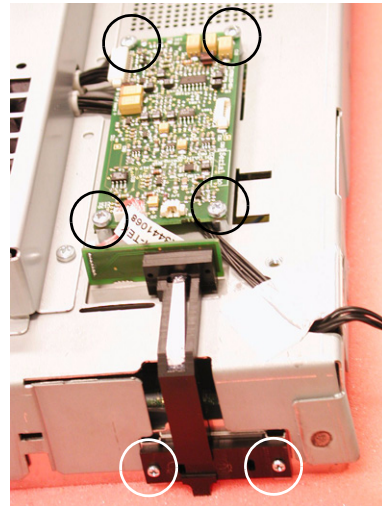
## 4.4 I-Guard unit

**To disassemble the I-Guard unit:**

1. Remove the plastic parts.
2. Unscrew the screw fixing the I-Guard board cover.



3. Remove the I-Guard board cover.
4. Disconnect the connector to the Signal board.
5. Unscrew the screws fixing the I-Guard board.
6. Unscrew the screws fixing the I-Guard light guide.



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## 4.5 Signal board

### EEPROM data

The EEPROM, containing all the display settings, is located on the Signal board. So if you are going to replace the Signal board, you must first export the EEPROM data to a file on your PC. After replacing the board you must upload the saved EEPROM data to the new Signal board.

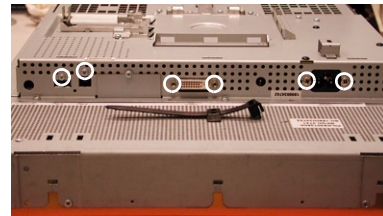
You can do this using MFDControl version 2.2.6.4 at least.

#### To read out the EEPROM data:

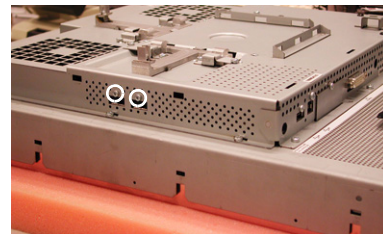
1. Start the software tool **Mfdcontrol.exe**.
2. In the main menu, select the proper display.
3. Click on **Upload**.
4. In the Upload window, click on **EEPROM to file**.
5. The data is saved on the PC as "EExxxxxx", where xxxxxx is the display serial number.

#### To disassemble the Signal board:

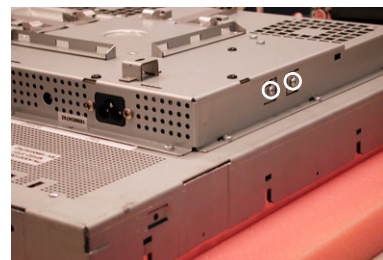
1. Remove the plastic parts.
2. Unscrew the screws and bolts from the connector side of the signal board cover.



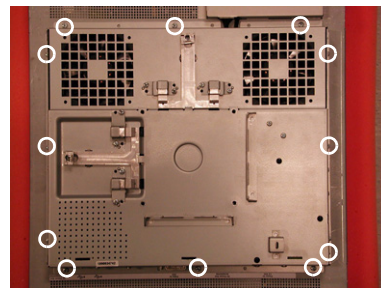
3. Unscrew the screws from the USB connectors at the other side.



4. Displays with internal power supply: unscrew the screws fixing the heatsink on the internal power supply.



5. Unscrew the 12 screws fixing the signal board cover.



6. Remove the signal board cover.
7. Disconnect the connectors from the board.
8. Unscrew the screws fixing the board.

#### To write the EEPROM data:

1. Start the software tool **Mfdcontrol.exe**.
2. In the main menu, select the proper display.
3. Click on **Upload**.
4. In the Upload window, click on **File to EEPROM** and locate the proper file.
5. Click **Open** to select the file.
6. The data is written into the display EEPROM.

#### Important



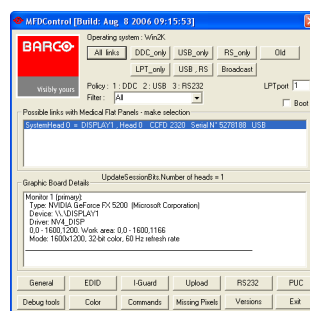
The display contains the ULT system to compensate the non-uniformities of the LCD panel. Therefore each panel is measured in the factory and the ULT data are stored in the display.

For this reason after swapping the Signal board you must re-load the ULT data.

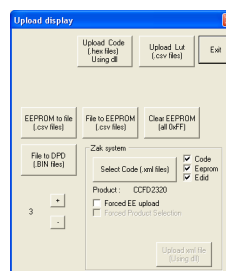
Contact Customer Service in Kortrijk to get the correct ULT data file.

#### To upload the ULT data file:

1. Start the program **Mfdcontrol.exe** (version 2.2.5.0 at least)
2. In the main menu, select the display of which you wish to upload the firmware.

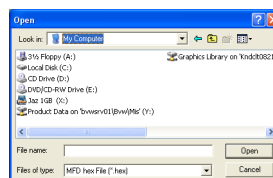


3. In the main menu, click the **Upload** button.

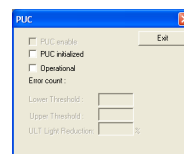


4. Click the **Upload Code (.hex files) Using dll** button.
5. Locate and select the proper .hex file and click **Open**.





6. During the upload, a dialog box is displayed with the status. The display will reboot when the upload is finished.
7. When finished, a message is displayed. Press **OK** and **Exit** to return to the main menu.
8. Now check if the upload was successful. Therefore, click **PUC** in Mfdcontrol.
9. Check all the options in the PUC window. Make sure **Error count** is 0. If not, PUC upload was not successful.



## 4.6 LCD panel & backlight

### Important



The display contains the ULT system to compensate the non-uniformities of the LCD panel. Therefore each panel is measured in the factory and the ULT data are stored in the display.

For this reason LCD panel replacement is not possible in the field. In case of a defect LCD panel, the display needs to be shipped back to BarcoView, Kortrijk.

## 4.7 I-Guard calibration

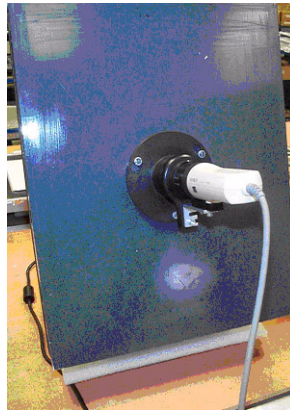
### Introduction

Calibration must be done after changing anything in the I-Guard system (e.g., I-Guard board or light guide).

The calibration must be performed using the Minolta CA 210 measurement instrument, the calibration cover and the Barco software tool MFDControl.exe (IMPORTANT- internal use only).

You must use the calibration cover because it is the only way to ensure that the lens of the Minolta is in the correct position and at the right distance of the panel.

The calibration is best performed in a darkened room.



Calibration set-up

### Warm-up times

- The Minolta must be warmed up for at least 15 min. before 0-calibration of the CA- 210 will be started (is needed to have the accuracy of 2% when you measure luminance values less then 5 cd/m<sup>2</sup>).
- The display must be warmed up for at least 2 hours without power interruption (no power saving).

### First perform the CA- 210 0-calibration

- Be sure the measuring probe is connected to the CA-210.
- Power-on the CA-210.
- Turn the pointing ring to the "0-CAL" position.
- Do not point the probe in the direction of high luminance. Be sure the pointing ring is set to "0-CAL" and not to "POINTER".
- Press the "0-cal" button on the CA-210.
- After 0-calibration, turn the pointing ring to the "MEAS" position.

### Remarks:

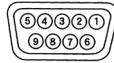
- If the ambient temperature changes, redo the zero calibration
- The zero calibration can be checked in normal working position by putting the measurement head on a flat surface, so no light will reach the sensor and the display will show 0.00 cd/m<sup>2</sup>. If the zero calibration is not well performed, the message "offset error" will appear or a value greater then zero will be measured.

### Then calibrate the I-guard with ULT on

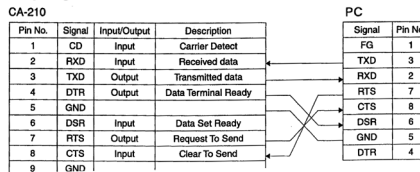
1. Connect the calibration cover to the display.

2. Connect the CA 210 to the PC by a proper cable (see illustration) and put the measuring probe in the calibration cover.

• Pin Assignment



• Wiring Diagram



3. Start the program **Mfdcontrol.exe** (version 2.2.6.4 at least).
4. In the main menu, click the **PUC** button.
5. Make sure the check box **PUC enable** is checked. Exit the PUC menu.
6. In the main menu, click the **I-Guard** button.
7. Click the **Color I-Guard** button for color displays or **Monochrome I-Guard** button for grayscale displays.
8. In the Monochrome I-Guard window, select the proper Minolta measuring tool by checking the corresponding check box.
9. Adjust the **Backlight** slider (color I-Guard: Backlight All) so that the measured Y value approximately matches the desired calibrated value (see technical specs).
10. Leave the display in this situation for 1 hour to eliminate the influence of temperature-dependent panel behaviour.
11. Click the **Calibrate** (color: Calibrate I-Guard) button.
12. When finished, exit the Built-in sensor and I-Guard calibration menus.



**Next, re-calibrate the I-guard with  
ULT off**

1. In the main menu, click the **PUC** button.
2. Clear the check box **PUC enable**. Exit the PUC menu.
3. In the main menu, click the **I-Guard** button.
4. Click the **Color I-Guard** button for color displays or **Monochrome I-Guard** button for grayscale displays.
5. Again, adjust the **Backlight** slider (color I-Guard: Backlight All) so that the measured Y value approximately matches the desired calibrated value (see technical specs).
6. Again, leave the display in this situation for 1 hour to eliminate the influence of temperature-dependent panel behaviour.
7. Click the **Calibrate** (color: Calibrate I-Guard) button.
8. When finished, exit the Built-in sensor and I-Guard calibration menus.
9. In the main menu, click the **PUC** button.
10. Check the check box **PUC enable**. Exit the PUC menu.

**At last, run the Modeling procedure**


1. In the main menu, click the **I-Guard** button.
2. Click the **Color I-Guard** button for color displays or **Monochrome I-Guard** button for grayscale displays.
3. In the Monochrome I-Guard window, select the proper Minolta measuring tool by checking the corresponding check box.

4. Click the button **Stabilizer modeling** (color: color stabilizer modeling).
5. When finished, exit MFDControl.

## **5. Advanced OSD menus**

## 5.1 To enter the advanced menus

**To enter the advanced menus:**

1. When the OSD is not on the screen, touch any of the soft touch keys.  
The front illumination is switched on for about 10 seconds.
2. While the illumination is on, touch the following keys in this sequence: Up >, Down <, Up >, Enter .
3. The main menu appears in advanced mode. This is indicated by an asterisk (\*) in the menu header.

## 5.2 Luminance (and color) menu

### Luminance and color menu

Name	Description
Measured luminance	Indicates the actual luminance measured by the I-Guard sensor. This is a read-only value.
Measured x*	Indicates the actual measured x co-ordinate (color).
Measured y*	Indicates the actual measured y co-ordinate (color).
Luminance target	Allows to manually adjust the luminance target. See note below.
Color target*	Allows to select from a list of factory-defined and user-defined color targets.
Color definition*	Jumps to the color definition submenu, which allows to change the definition of the user-defined color targets.
Manual backlight	Manual backlight adjustment
Multiplier red*	Manual R adjustment
Multiplier green*	Manual G adjustment
Multiplier blue*	Manual B adjustment
Stabilizer	Switches I-Guard stabilizer on/off
BLOF state	Indicates the current BLOF (backlight sensor) state.

\* Available only on color displays



**Note:** When you change the luminance target, the display will adjust its backlight to reach the target. This can be seen in the Measured luminance line.

When the luminance target cannot be reached, e.g., due to aging of the backlight, the Measured luminance line changes to **Minimum value reached** or **Maximum value reached**.

### Color definition submenu\*

\* Available only on color displays

A color target is defined by its luminance target and color temperature. The color definition submenu allows to edit these values.

Name	Description
Color name	Indicates the color target you are editing. You can select another color target to edit by using the Up > and Down < touch keys.
Luminance target	Allows to select the luminance target that corresponds to the color target.



Name	Description
Defined in	Indicates how the color temperature is defined: in (x,y) co-ordinates or Kelvin (K). You can switch between both by using the Up > and Down < touch keys. This function is available only when the User color target is selected.
x	Allows to define the x co-ordinate of the color temperature that corresponds to the color target. This function is available only when the color target is defined in (x,y) co-ordinates. This function is not available when the Native White color target is selected.
y	Allows to define the y co-ordinate of the color temperature that corresponds to the color target. This function is available only when the color target is defined in (x,y) co-ordinates. This function is not available when the Native White color target is selected.
Color temperature	Allows to define the color temperature that corresponds to the color target in Kelvin units. This function is available only when the color target is defined in Kelvin units. This function is available only when the User color target is selected.
Restore factory x,y values	Allows to reset the (x,y) co-ordinates of the color temperature to the factory values. This function is not available when the Native White color target is selected.

## 5.3 Display Function menu

### Display function menu


Name	Description
Display function	Allows to select from a list of pre-defined display functions. If the DICOM DF is selected, a number of additional settings is available.
ALC & DICOM options	Jumps to the ALC & DICOM Options sub-menu, which allows to edit the settings for the DICOM display function. This function is available only when the DICOM DF is selected.

### ALC & DICOM Options submenu

Name	Description
Measured ambient light	Indicates the ambient light actually measured by the ambient light sensor on the front of the display. This is a read-only value.
Averaged ambient light	Shows the average of the measured ambient light since the display was switched on. When you execute the function "Measure ALC Value", this value will be stored as the Measured ALC correction value for the selected reading room, unless this value is higher than the maximum ambient light determined for the selected reading room.
Correction value	Shows the ambient light correction value that is taken into account in the calculation of the display function.
Correction value	Indicates the correction value in cd/m <sup>2</sup>
Reflection coefficient	Indicates the panel reflection coefficient measured in the factory.
Cont. DICOM ALC	Allows to switch continuous DICOM ALC on/off. When switched on, the DICOM DF is recalculated <i>continuously</i> taking the averaged ambient light into account. When switched off, the DICOM DF is recalculated <i>only</i> at the moment the DICOM Offset is changed (see below). This function is available only when the DICOM DF is selected.
ALC average time	Adjustment of the period the ALC takes to calculate the average. The smaller this figure, the faster the ALC average value follows changes in the ambient light.

Name	Description
DICOM offset	<p>When Continuous DICOM ALC is switched off, the DICOM DF is recalculated at the moment the DICOM Offset is changed, taking the new DICOM Offset into account.</p> <ul style="list-style-type: none"><li>• When set to "Dark Room", the ambient light is not taken into account.</li><li>• When set to "Preset", a preset ambient light value determined by the selected reading room is taken into account.</li><li>• When set to "Measured ALC", the averaged ambient light, determined by the selected reading room, is taken into account.</li></ul> <p>This function is available only when Continuous DICOM ALC is off.</p>
Reading room	<p>Allows to select from a pre-defined list of reading room types. You must select a reading room that corresponds to the type of room the display is installed in. This function is available only when Continuous DICOM ALC is off.</p>
Reading room def.	<p>Jumps to the reading room definition submenu, which allows to edit the reading room condition settings. This function is available only when Continuous DICOM ALC is off.</p>
Calibration info	<p>Jumps to the calculation information submenu, which displays information about the values taken into account to recalculate the DICOM DF.</p>

## Reading room definition submenu

Name	Description
Measured ambient light	Indicates the ambient light actually measured by the ambient light sensor on the front of the display. This is a read-only value.
Averaged ambient light	Shows the average of the measured ambient light since the display was switched on. This is a read-only value.
Reading room	Indicates the reading room type you are editing. You can select another room to edit by using the Up > or Down < touch keys.
Max. ambient light	This indicates the maximum ambient light that corresponds to the selected reading room. If the measured ambient light is higher than the value entered here, you should take measures to darken the room or select another reading room type.
Preset corr. value	This value is taken into account in the calculation of the DICOM DF if Continuous DICOM ALC is switched off and DICOM Offset is set to "Preset". To each reading room type corresponds another preset value.
Measure ALC value	The value shown here is taken into account in the calculation of the DICOM DF if Continuous DICOM ALC is switched off and DICOM Offset is set to "Measured ALC". When you select this line and press Enter  , the actual averaged ambient light value is stored here, overwriting the former value. However, if the averaged ambient light value is higher than the maximum ambient light value that corresponds to the selected reading room, a warning is displayed prompting you to dim the light in the room, and the value will be limited to the maximum ambient light value. If you dim the light in the room you can execute the Measure ALC Value function again to enter the new, lower value.

## Calibration Information submenu

Name	Description
Preset ambient value / Measured ALC ambient value / Average ambient value	Shows the ambient light correction value taken into account to calculate the DICOM DF, expressed in lux.

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Name	Description
Bright luminance	Shows the bright luminance value taken into account to calculate the DICOM DF.
Dark luminance	Shows the dark luminance value taken into account to calculate the DICOM DF.
Ambient correction	Shows the ambient light correction value taken into account to calculate the DICOM DF, expressed in cd/m <sup>2</sup> .

## 5.4 Settings menu






Name	Description
DPMS	Allows to switch the display power management system on/off. See note below.
Power LED	Allows to switch the power LED's on state on/off. The LED's orange DPMS state is not influenced by this setting. So, when the display goes into power-saving mode, the LED will turn orange, even if it was switched off by this setting.
User controls	Allows to disable the touch keys on the front. When switched off, the user cannot display the OSD until the user controls key-code is entered.
Sound	Allows to switch the sound on/off. When switched on, a short beep sounds each time you touch a soft touch key.
Automatic menu exit	Allows to switch the automatic menu exit on/off. When switched on, the OSD is closed automatically when left idle for a certain time.
ULT	Allows to switch ULT (uniform light technology) on/off.
Panel orientation	Allows to set panel position to auto, portrait or landscape. In auto position, the firmware detects the current panel orientation automatically.
Auto rotation	Allows to switch the automatic rotation of the image on or off.
DVI input	Allows to set the format of the DVI input. In auto position, the firmware detects the format of the connected DVI signals automatically.
Input mode*	Allows to select the input mode (the way the color video signal is processed): RGB->Y, R->Y, G->Y or B->Y
Stabiliser	Allows to switch the stabiliser on/off.
Patch	Allows to switch the I-Guard patch on/off.
Burn-in-mode	Allows to switch the burn-in test pattern on/off. When switched on, the display shows a white field when no video signal is connected.

**Note:**



- The **DPMS** system will power down the display when the connected computer is left idle for a certain time.

Barco recommends to switch DPMS on to prevent image burn-in (image retention) on the LCD panel.

- To enter the **user controls** keycode, the OSD must not be visible. Touch any of the soft touch keys to switch on the front illumination. While the illumination is on, touch the following keys in successive order: Enter , Down , Up , Down , Enter .

## 5.5 Information menu

### Information

Name	Description
Product	The display type
Serial No	Indicates the display serial number
SW Version	Displays the current internal software version
Display Lifetime	Indicates the total time the display has been operating, including the time in stand-by
Backlight Lifetime	Indicates the total time the display has been operating, excluding the time in stand-by
Service	Opens the Service information submenu
Firmware	Opens the Firmware information submenu
Runtimes	Opens the Runtimes information submenu
Measurements	Opens the Measurements information submenu
Scan measurements	Opens the Scan measurements information submenu
ULT	Opens the ULT information submenu

### Service information submenu

Name	Description
Display name	The display name as entered in the factory
Display ser no	Display serial number
Display stock no	The order number for the display
Panel ser no	The LCD panel serial number
Panel prod date	The LCD panel production date

### Firmware information submenu

Name	Description
Boot code version	The version of the boot code firmware
Run code version	The version of the run code firmware
FPGA1 code version	The version of the firmware code for FPGA1
FPGA2 code version	The version of the firmware code for FPGA2

### Runtime information submenu

Name	Description
Display lifetime	The time the display has been operating, including power-save mode



Name	Description
Backlight lifetime	The time the backlight has been operating. This is also the time the display has been operating in on-mode (so not in power-save mode)
Backlight runtime	The time the backlight has been operating since the last time it was switched off (e.g., in stand-by). This counter is reset after 1092 minutes

#### Measurement information submenu

Name	Description
Internal temperature	The temperature measured on the Signal board
IGuard temperature	The temperature measured near the I-Guard
BLOF temperature	The temperature measured near the backlight sensor
Fan speed	The speed of the fan
IGuard x value*	The x co-ordinate of the color measured by the I-Guard
IGuard y value*	The y co-ordinate of the color measured by the I-Guard
IGuard X value*	The X value of the color measured by the I-Guard
IGuard Y value	The luminance (Y) measured by the I-Guard
IGuard Z value*	The Z co-ordinate of the color measured by the I-Guard
IGuard RAW value RED*	The raw R value measured by the I-Guard
IGuard RAW value GREEN*	The raw G value measured by the I-Guard
IGuard RAW value BLUE*	The raw B value measured by the I-Guard
BLOF RAW value	The raw backlight sensor value measured by the I-Guard

\*: Only in color displays

**Scan measurement information submenu**

Name	Description
DVI input	Indicates the DVI format of the connected video signal
DVI link	Indicates the current DVI link format
Resolution	Indicates the video signal resolution
Clock frequency	Indicates the internal clock frequency
Hor. total	The width of the total horizontal interval
Hor active	The width of the horizontal active interval
Hor blanking	The width of the horizontal blanking
Hor front porch	The width of the horizontal front porch
Hor sync	The width of the horizontal sync
Hor back porch	The width of the horizontal back porch
Hor frequency	The current horizontal frequency
Vert. total	The width of the total vertical interval
Vert active	The width of the vertical active interval
Vert blanking	The width of the vertical blanking
Vert front porch	The width of the vertical front porch
Vert sync	The width of the vertical sync
Vert back porch	The width of the vertical back porch
Vert frequency	The current vertical frequency

**ULT information submenu**

Name	Description
Status	Indicates the status of the ULT circuit
Nr reconfigurations	Indicates the number of reconfigurations
Nr TFC retries	The number of TFC retries
Nr PIX retries	The number of PIX retries

## 5.6 Adjustments menu

## 6. Technical specifications

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Item	MDCC 2121	MDCG 2121 CB
Picture panel	TFT AM-LCD Dual Domain IPS color	IPS SA-SFT
Native resolution	1600x1200	1600x1200
Native color resolution	8 bits / sub-pixel	8 bits / sub-pixel
Pixel Pitch	0.270 mm (H) x 0.270 mm (V)	0.270 mm (H) x 0.270 mm (V)
Active diagonal	540 mm (21.3 -inch)	540 mm (21.3 -inch)
Display area (H x V)	432.0x324.0 (mm)	432.0x324.0 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 170° Horizontal: 170°	Vertical: 170° Horizontal: 170°
Contrast ratio	500/1 (typical in dark environment)	800/1 (typical in dark environment)
Luminance	300 cd/m <sup>2</sup> (calibrated, backlight age<20,000 hours)	500 cd/m <sup>2</sup> (calibrated, backlight age<30,000 hours)
Response time	25.2 ms typical (@ 25° C after 30 min warm-up)	35 ms typical (@ 25° C after 30 min warm-up)
Signal systems	DVI Digital Complying to DVI Rev 1.0 specifications	DVI single and dual link Complying to DVI Rev 1.0 specifications
USB standard	USB 2.0	USB 2.0
Input signals	Possible resolutions: • 640 x 480 @ 60, 75, 85, 100 Hz • 800 x 600 @ 60 Hz • 1024x768 @ 60 Hz • 1152x870 @ 60 Hz • 1280x1024 @ 59, 60 Hz • 1600x1200 @ 59, 60 Hz	Possible resolutions: • 640 x 480 @ 60, 75, 85, 100 Hz • 800 x 600 @ 60 Hz • 1024x768 @ 60 Hz • 1152x870 @ 60 Hz • 1280x1024 @ 59, 60 Hz • 1600x1200 @ 59, 60 Hz
Power source	External 12 VDC power supply unit: 90 ~ 264 VAC	External 12 VDC power supply unit: 90 ~ 264 VAC
Power consumption	63 watts (max., at 90 VAC, calibrated position, no USB load)	74 watts (max., at 90 VAC, calibrated position, no USB load)
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 381 x 666.9 x 284.5 mm	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 369 x 559 x 285 mm
Net weight unpacked	15.1 kg	15.9 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs	0°C to 40°C, 15°C to 35°C within specs

Item	MDCC 2121	MDCG 2121 CB
Storage Temperature	-20°C to 60°C	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 3000 m operation	7500 m storage 3000 m operation

Item	MDCC 3120 DL	MDCG 3120 CB
Picture panel	TFT AM-LCD Dual Domain IPS color	AM-LCD IPS
Native resolution	2048x1536	2048x1536
Native color resolution	8 bits / sub-pixel	8 bits / sub-pixel
Pixel Pitch	0.207 mm (H) x 0.207 mm (V)	0.207 mm (H) x 0.207 mm (V)
Active diagonal	528 mm (20.8 -inch)	528 mm (20.8 -inch)
Display area (H x V)	423.9x318.0 (mm)	423.0x318.0 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 170° Horizontal: 170°	Vertical: 170° Horizontal: 170°
Contrast ratio	400/1 (typical in dark environment)	900/1 (typical in dark environment)
Luminance	500 cd/m <sup>2</sup> (calibrated, backlight age<20,000 hours)	500 cd/m <sup>2</sup> (calibrated, backlight age<30,000 hours)
Response time	50 ms typical (@ 25° C after 30 min warm-up)	50 ms typical (@ 25° C after 30 min warm-up)
Signal systems	DVI dual channel Complying to DVI Rev 1.0 specifications	DVI single and dual link Complying to DVI Rev 1.0 specifications
USB standard	USB 2.0	USB 2.0
Input signals	Possible resolutions: • 640 x 480 @ 60, 75, 85, 100 Hz • 800 x 600 @ 60 Hz • 1024x768 @ 60 Hz • 1152x870 @ 60 Hz • 1280x1024 @ 59, 60 Hz • 1600x1200 @ 59, 60 Hz • 2048x1536 @ 30, 59, 60 Hz	Possible resolutions: • 640 x 480 @ 60, 75, 85, 100 Hz • 800 x 600 @ 60 Hz • 1024x768 @ 60 Hz • 1152x870 @ 60 Hz • 1280x1024 @ 59, 60 Hz • 1600x1200 @ 59, 60 Hz • 2048x1536 @ 58, 59 Hz • 2560x2048 @ 50, 60 Hz
Power source	External 12 VDC power supply unit: 90 ~ 264 VAC	External 12 VDC power supply unit: 90 ~ 264 VAC

Item	MDCC 3120 DL	MDCG 3120 CB
Power consumption	112 watts (nominal, at 90 VAC, calibrated position, no USB load)	84.7 watts (nominal, at 90 VAC, calibrated position, no USB load)
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 368.4 x 660.8 x 284.5 mm	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 369 x 559 x 285 mm
Net weight unpacked	15.1 kg	15.9 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 3000 m operation	7500 m storage 3000 m operation